

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
 Organization
 International Bureau



(43) International Publication Date
 22 July 2004 (22.07.2004)

PCT

(10) International Publication Number
 WO 2004/060620 A2

- | | |
|---|---|
| <p>(51) International Patent Classification⁷: B26F</p> <p>(21) International Application Number: PCT/US2003/041495</p> <p>(22) International Filing Date: 30 December 2003 (30.12.2003)</p> <p>(25) Filing Language: English</p> <p>(26) Publication Language: English</p> <p>(30) Priority Data: 102 61 748.1 30 December 2002 (30.12.2002) DE</p> <p>(71) Applicant (for all designated States except US): MATE PRECISION TOOLING INC. [US/US]; 1295 Lund Boulevard, Anoka, MN 55303 (US).</p> | <p>(72) Inventor; and</p> <p>(75) Inventor/Applicant (for US only): SCHNEIDER, Albrecht [DE/DE]; Herderstrasse 5, D-61440 Oberursel (DE).</p> <p>(74) Agent: PETRY, Marvin; Larson & Taylor, PLC, Suite 900, 1199 North Fairfax Street, Alexandria, VA 22314 (US).</p> <p>(81) Designated State (national): US.</p> <p>(84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).</p> <p>Published:
 — without international search report and to be republished upon receipt of that report</p> <p>For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.</p> |
|---|---|

(54) Title: PUNCHING TOOL

(57) Abstract—A punching tool has a guided, axially displaceable die plunger, which is fixed against relative rotation, in a guide bushing. In a bore in its front end a punching die is seated. During the punching stroke the punching die rests against a front face of the die plunger and is axially fixed in place by means of one or several snap-in balls, each of which is seated in a transverse bore, which snap-in balls are maintained in engagement with an annular groove by means of a spring washer in the die plunger. The outer diameter of the spring washer is only slightly less in the engagement position than the inner diameter of the guide bushing and can be elastically widened for releasing the punching die outside of the guide bushing.

WO 2004/060620 A2